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Minebea Co., Ltd. a Japanese Corporation

Electric motor for a linear drive system

Patent claims

1. An electric motor for a linear drive system comprising a motor housing within which a stator, a rotor and a threaded shank are accommodated,
the stator having a stator core and phase windings which are connected to phase connectors,
the rotor being mounted onto a rotor hub,
the rotor hub being supported in the motor housing by roller bearings and coupled to the threaded shank via a thread in order to transform the rotation of the rotor into a translational motion of the threaded shank,
wherein
the motor housing includes an injection molded part within which the stator, together with the stator core and the phase windings, is embedded and a linear guide to accommodate and guide the threaded shank is integrated into
the injection molded part of motor housing.

2. An electric motor according to claim 1, wherein a stop to position the threaded shank is integrated into the injection molded part of the motor housing, the stop interacting with the linear guide.

3. An electric motor according to claim 2, wherein the phase connectors are also embedded in the injection molded part of the motor housing.

4. An electric motor according to claim 1, wherein the threaded shank has an outer thread and the rotor hub has an inner thread which interact with each other.

5. An electric motor according to claim 4, wherein the rotor hub includes an injection molded part within which the rotor is embedded.

6. An electric motor according to claim 2, wherein bearing supports for the roller bearings are integrated into the injection molded part of the motor housing and a motor flange is molded onto the injection molded part of the motor housing.

7. An electric motor for a linear drive system comprising a motor housing within which a stator, a rotor and a threaded shank are accommodated,
the rotor being mounted on a rotor hub,
the rotor hub being supported in the motor housing by roller bearings and coupled to the threaded shank via a thread in order to transform the rotation of the rotor into a translational motion of the threaded shaft,
wherein
the rotor hub includes an injection molded part within which the rotor is fixed, and the injection molded part of the rotor hub has an inner thread which interacts with an outer thread of the threaded shank.

8. An electric motor according to claim 7, wherein the rotor has two pole plates which are separated by a permanent magnet, the pole plates and the permanent magnet being held and positioned in the injection molded part of the rotor hub.

9. An electric motor according to claim 8, wherein bearing supports for the roller bearings are integrated into the injection molded part of the rotor hub.

10. A linear actuator having an electric motor according to one of the above claims, wherein the electric motor is a hybrid stepping motor.